

LARIAC4

LiDAR QA/QC Status Update

Dewberry Project Management

- Dave Maune – Project Manager and Josh Novac – Deputy Project Manager (Phil Thiel PIC)
- Elise MacPherson – New Sr. Project Manager background:
 - 19 years experience in LiDAR
 - 4 years as data analyst with Optech – sensor manufacturer
 - 11 years in the California LiDAR market – business development and logistics/PM with Airborne 1 in El Segundo
 - Managed small to very large commercial LiDAR projects (Google) as well as California County projects (Ventura and Riverside)
 - Project Management Professional (PMP) since 2013

Review from last meeting

- Acceptance Criteria for all LiDAR deliverables
 - Collection requirements (spot spacing, overlap, weather conditions, leaf-off conditions etc.)
 - Accuracy (NVA <10cm RMSE, VVA <29.4cm RMSE, relative accuracy <8cm RMSE)
 - Deliverables (LAS formats, breaklines, DEM/DSMs, contours, intensity imagery, accuracy reports and metadata)

Statement of Work for QA/QC of Digital Terrain Data (LiDAR)

- **11a:** Perform quantitative, qualitative and completeness reviews to ensure consistency with USGS LiDAR Base specification **1.2** and agreement with County's expectation of Pictometry
- Review LAS files
- **11b:** Review Breaklines
- **11c:** Review raster DEM
- **11d:** Review Contours
- **11e:** Project oversight and PM duties – monitor progress of QC and assure accurate reporting

Criteria Assessed for LAS

Area Delivered Early Jan. 2016: Catalina Island (Block 14)



- Only LAS has been delivered so far
- Pass/Fail grade to all criteria in table

Validation	Description
Overlap and Withheld Points	Withheld and Overlap Bits Required
Coordinate Reference System	LAS files should have the projection/datum defined.
Spatial Reference Information	Variable Length Record should be in Well Known Text (WKT) format
Point Data Format	Should be format 6
Global Encoder Bit	Should be 17 for Adjusted GPS Time
System ID	Should be recorded in the LAS header for determination of processing system
Major Version	Should be 1 (for LAS 1.4)
Minor Version	Should be 4 (for LAS 1.4)
Classes	Required Classes include: Class 1: Unclassified Class 2: Ground Class 7: Low Noise Class 9: Water Class 10: Ignored Ground Class 17: Bridges Class 18: High Noise
Time Stamp	Should be documented and meet the project requirement for Adjusted GPS Time
Multiple Returns	The sensor shall be able to collect multiple returns per pulse and the return numbers are recorded
Intensity	16 bit intensity values are recorded for each pulse

LiDAR Data QC Progress

- **Results:**

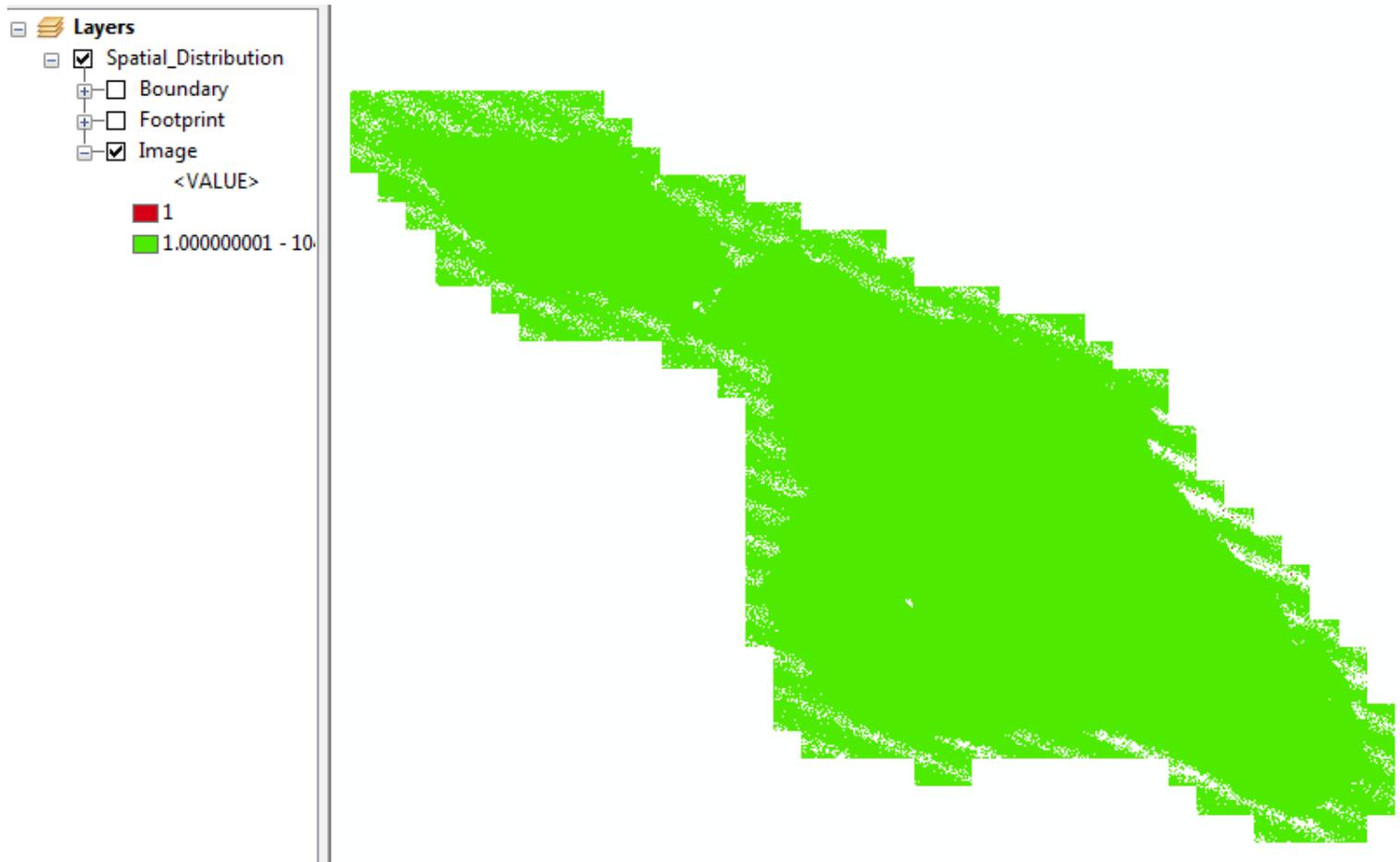
- 1. Quality of the LiDAR editing looked very good – no major anomalies/artifacts**
- 2. A few minor items related to the LAS headers that will need to be addressed prior to acceptance.**

Outcome: 

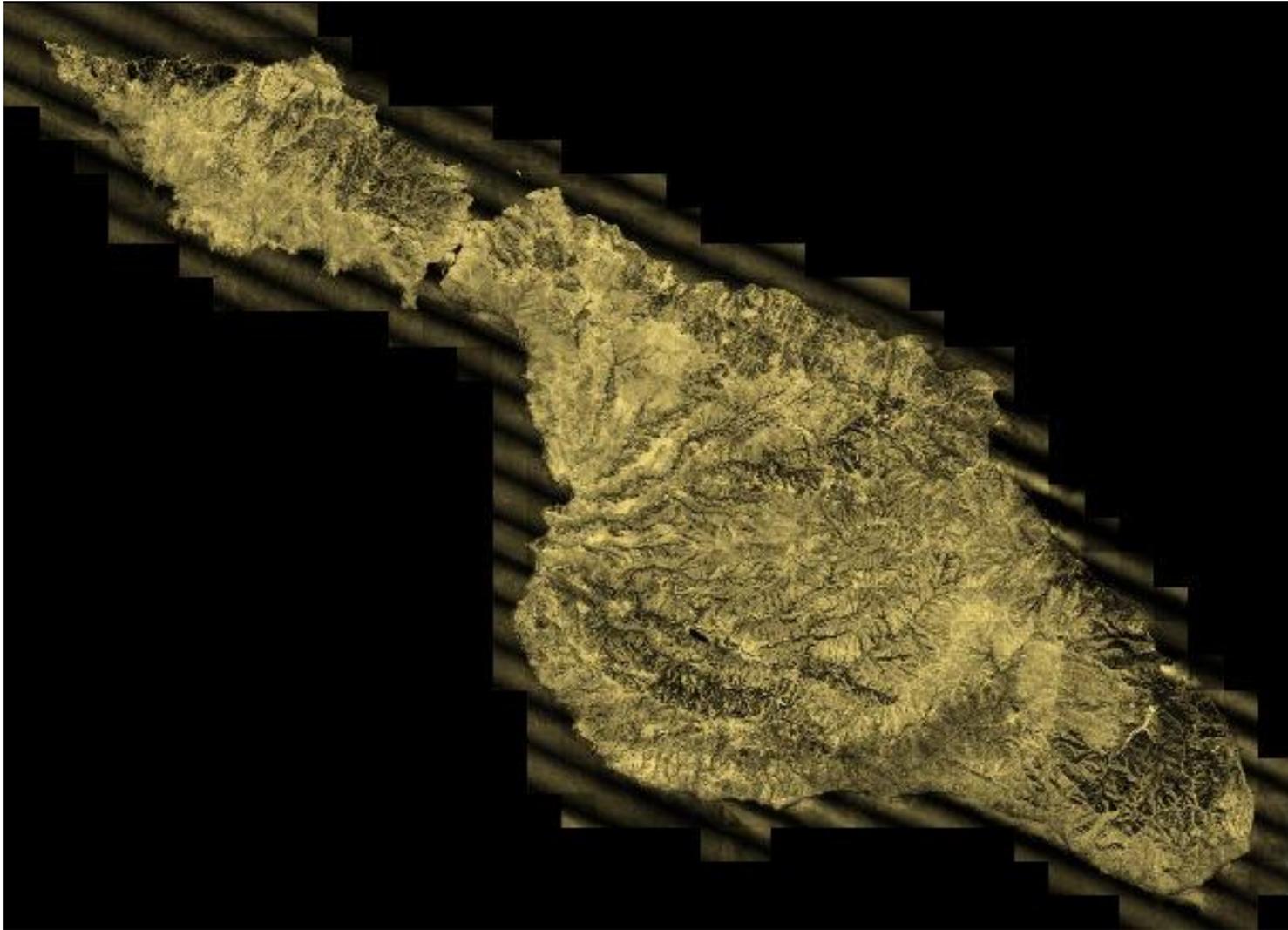
LiDAR has met the required accuracy standards and is ready to be used in the generation of the DEMs/Contours!

Spatial Distribution

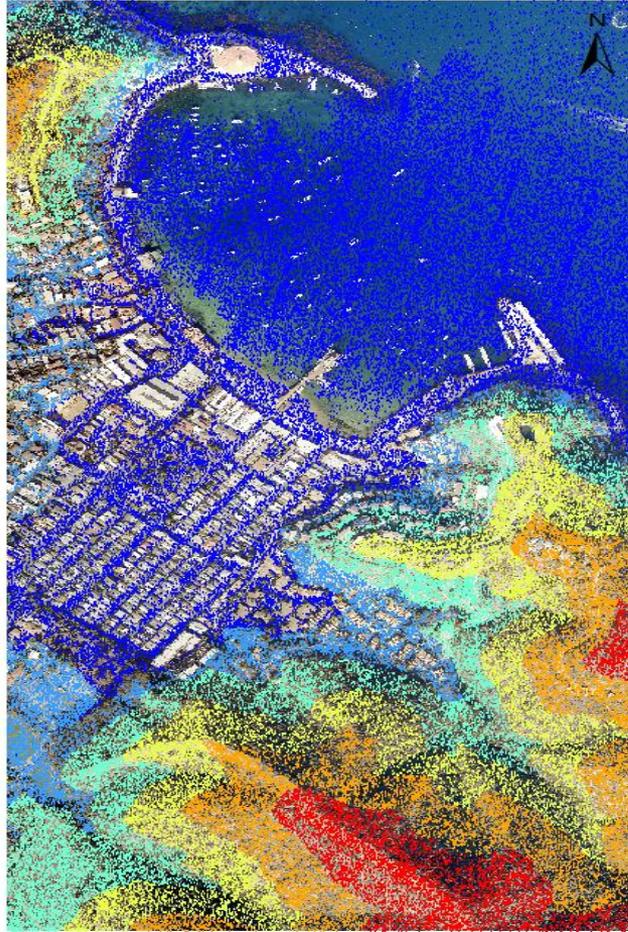
- Uniform and free from clustering



LiDAR Intensity Imagery



LARIAC - Avalon, Catalina Island
LiDAR Ground Class Only

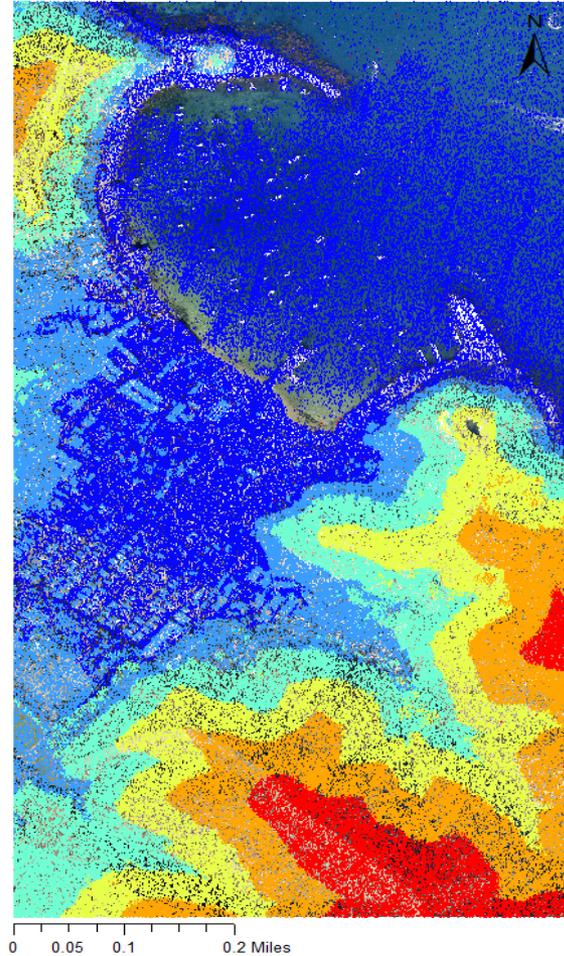


LARIAC - Avalon, Catalina Island
LiDAR Ground Class Only

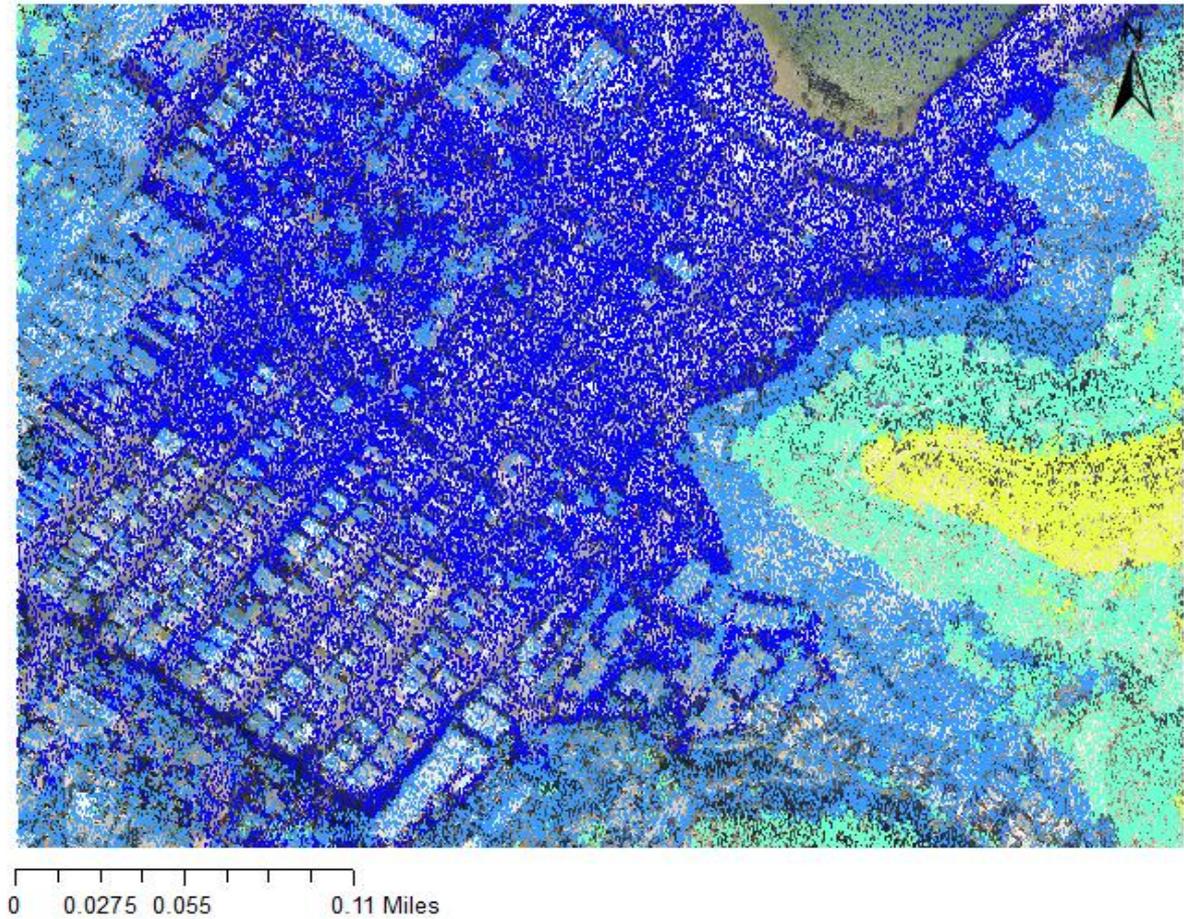


0 0.0275 0.055 0.11 Miles

LARIAC - Avalon, Catalina Island
LiDAR Full Point Cloud



LARIAC - Avalon, Catalina Island
LiDAR Full Point Cloud



Deliverables to LARIAC

- LAS 1.4 (end users should assure ingesting is possible)
- Hydrographic Breaklines for streams > 50' wide or > 3/4 of an acre
- Cartographic Contours (1')
- Intensity Imagery

Notes: If delivered in LAZ format, we will provide the unzip utility. Files <1TB will not be zipped.

There will be a temporal change in the LiDAR data vs. imagery (will not match perfectly)

Questions?

- Dewberry is interested in getting a schedule of incoming data products from Pictometry – timing?